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# FRBSF WEEKLY LETTER

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## Leverage And Double Leverage In Banking

Banking firms, like other corporate entities, finance their activities by issuing debt and equity securities. The greater the ratio of debt-to-equity used in financing the firm, the more the firm is said to be "leveraged."

In most industries, firms are free to determine their own degree of leverage, disciplined only by market forces. This is not true in the banking industry where the financial structure of a banking firm is seen to have important public policy implications. In particular, because a large proportion of a bank's debt consists of deposits, regulators wish to ensure that banks maintain adequate equity or "capital" to protect depositors against a decline in the value of the bank's assets. Regulators have a special interest in maintaining public confidence in deposits because deposits make up the bulk of the nation's money supply.

Regulators have been concerned in recent years about the adequacy of bank capital and most recently have revised bank capital standards. The purpose of this *Letter* is to review the nature of bank leverage in light of the broader theory of the optimal financial structure of the firm. As we shall see, this helps in understanding problems encountered in imposing minimum capital standards on financial institutions.

### Theory of leverage

The effect of increased reliance on debt in a corporation has two components. First, increased leverage raises the expected return (earnings per share) to shareholders, tending to make those shares more valuable. Second, increased reliance on debt weakens the firm's ability to survive fluctuations in the value of its assets without default and subsequent bankruptcy.

These two components of the effect of increased leverage have offsetting effects on the price per share of the firm's equity. Indeed, economists Franco Modigliani and Martin Miller demonstrated that, in a simplified theoretical framework, the effects would be *exactly* offsetting. The value of shares and, hence, the value of the firm,

should not vary with the degree of leverage employed. Thus, a firm with a given portfolio of assets should theoretically be unable to make its shareholders better off simply by manipulating the degree of leverage.

### Leverage and taxes

There is some debate over whether this so-called "invariance proposition" still holds when a major distorting factor such as tax policy intrudes. In particular, interest payments on debt are deductible against corporate income whereas dividend distributions and retained earnings are not. Some analysts argue, therefore, that shareholders would prefer a high leverage strategy because such a strategy would "shield" more of the firm's income from taxation and thereby increase shareholders' after-tax earnings prospects and hence, their wealth.

It can be argued, however, that these advantages of debt at the *corporate* level are offset by disadvantages at the level of personal taxation, where the proceeds from equity ownership receive preferential treatment compared to interest income. (That is, capital gains are taxed at a rate lower than interest income.) The result is that debt and equity may well have different "clienteles." For individuals facing high personal tax rates, the after-tax cost disadvantages of equity at the corporate level are more than offset by its advantages at the personal level. The opposite is true for individuals facing low tax rates.

The quantity of debt and equity willingly held by the marketplace and the equilibrium yield will be determined by the relative strength of the demand by the two clienteles. As Merton Miller has pointed out, this "clienteles effect" will determine the relative shares of debt and equity for the economy as a whole, but not the optimal leverage for the individual firm. Managers therefore can make different decisions about leverage without adversely affecting shareholder wealth. This may explain why, at least among nonfinancial corporations, we observe the successful co-existence of both highly leveraged and all-equity firms.

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## Leverage in banking

Such clearly is not the case among financial intermediaries — all of which are highly leveraged. This observation is, at least partly, definitional. Financial intermediaries are firms that have specialized in converting one form of financial liability to another. They thus issue significant quantities of debt. It follows, therefore, that true financial intermediaries — banks, savings and loan associations, consumer finance companies, and so on — will tend to be more highly leveraged than nonfinancial corporations. Indeed, equity represents only about 5 percent of the total sources of funds for banks and thrifts and 15 percent for consumer finance companies, against over 70 percent for nonfinancial corporations.

Simply distinguishing this set of institutions as highly leveraged does not mean that the invariance proposition no longer holds. Firms in the business of making loans could be unleveraged and still compete with financial intermediaries. Indeed, all-equity enterprises such as mutual funds coexist with financial intermediaries in loan markets. Why then do bank regulators today continually struggle to keep leverage from increasing still further? If the invariance proposition truly held in the case of banking, the cost (in terms of shareholder wealth) of complying with regulatory capital standards would be zero and such a struggle would not persist.

## Deposit protection and leverage

One possible explanation for the apparent violation of the invariance proposition is depositor protection policy, whereby holders of deposit debt are protected from risk either explicitly — through deposit insurance schemes — or implicitly through the actions of banking agencies that have the effect of protecting debt-holders, insured or not. To the extent that such protection is available to banks at a cost lower than its expected insurance value, banks can increase their expected earnings (and shareholder wealth) by increasing their use of such debt.

This hypothesized relationship between deposit protection and leverage is supported by the data (see Chart). Bank debt-to-equity ratios climbed sharply immediately after the introduction of deposit insurance in 1933 and fell back only

when capital regulation was pursued in earnest in the early 1950s. Since then, debt-to-equity ratios have risen steadily as the degree of deposit protection has grown.

The notion that deposit protection induces increased leverage also finds support in the fact that leverage is typically greater in depository intermediaries than in nondepository intermediaries such as consumer finance companies and insurance companies. These other financial corporations typically rely three to five times more on equity than depository intermediaries such as banks and thrifts.

Data on the market value of the shares in financial corporations provide additional support. Despite the fact that some banking and thrift institutions have portfolios that are “under water” in terms of market value (that is, their liabilities exceed the market value of their assets), their shares continue to have positive market value. An unreported asset — deposit protection — could account for this phenomenon.

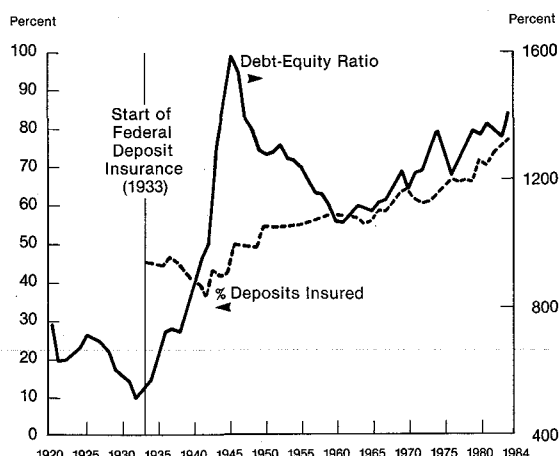
## Regulation of bank capital

The strength of existing incentives to increase leverage is evidenced by the difficulties regulators encounter in regulating capital. Numerous factors have made capital standards less binding in practice than in theory. One factor is the mechanism employed by regulators to determine capital standards. Without any hard theory to guide them, regulators have employed peer group analysis to devise capital standards. While such a mechanism permits identification of banks whose leverage is much greater than the norm for comparable institutions, it does not protect against gradual increases in leverage for the peer group as a whole.

There also has been a legitimate debate as to precisely what constitutes “capital” for the purposes sought by regulators, namely, to protect depositors from the loss of their funds and thereby protect the banking system from the consequences of runs and failures. For example, because subordinated debt (that is, debt obligations that are subordinate to a bank’s obligations to its depositors) in theory protects deposit debt in the event that the value of a bank’s assets deteriorates, banks have argued (sometimes successfully) that the regulatory definition of “capital” could include subordinated debt in addition to true equity.

This expanded definition raises an important question, however. Why would banks wish to

## Deposit Insurance And Trends In Leverage



issue subordinated debt rather than equity since — according to the invariance proposition at least — equity and (unprotected) debt would be equally costly? One possible answer is that the protection afforded deposits “spills over” onto other forms of bank debt as well. That is, the marketplace perceives subordinated bank debt as enjoying some default protection as well, since regulators typically close banks before such debt is jeopardized. The effects of this protection argue that regulators should not include subordinated debt in capital adequacy standards.

### Bank holding companies and leverage

The bank holding company (BHC) form of banking organization also can make it difficult for regulators to maintain desired leverage standards in banking. A bank holding company is a corporation that issues its own debt and equity securities and that invests the proceeds in the debt or equity of a subsidiary bank.

This process of using funds is referred to as “downstreaming.” When the parent BHC issues debt to acquire the debt of the subsidiary bank, the phenomenon is referred to as “simple leverage.” When the proceeds of the parent debt issue are downstreamed as equity, the practice is referred to as “double leverage.” To an outside investor, leverage of the consolidated enterprise

is the same whether simple or double leverage internal financing techniques are employed.

(Double leverage can be detected by examining the balance sheets of the bank and its parent holding company. Specifically, if the parent BHC has less equity capital than the bank it owns, some of the BHC debt must have been downstreamed to the bank as equity.)

### The rationale of double leverage

Although BHC shareholders should be indifferent between single and double leverage techniques on the basis of wealth considerations, they appear to prefer the double leverage technique. By employing double leverage, BHC management can use debt to satisfy capital adequacy standards that are more stringent for banks than BHCs.

Double leverage financing is particularly interesting because it takes place despite other supervisory policies that would be expected to favor simple leverage. In particular, bank supervisors limit the payout of dividends by banks. In the case of double leverage finance, it is precisely these dividend flows that must be “upstreamed” to service the BHC debt. In contrast, if simple leverage were used, the revenues of the bank would have flowed out as interest payments to the BHC. Bank supervisors consider interest payments an expense and do not impede their flow.

Since simple leverage gives the BHC freer access to the revenues of the subsidiary bank, there is less risk of debt-servicing or default problems. The fact that BHC shareholders are willing to expose themselves to greater risk in exchange for avoiding capital standards supports the notion that capital standards are costly to banking organizations.

In conclusion, it appears that deposit protection causes the invariance proposition to be violated in the banking industry. It induces managers of banking firms to resist capital regulation and sets the stage for what is likely to be a long-lived struggle between banks and regulators of bank capital.

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# Research Department Federal Reserve Bank of San Francisco

## BANKING DATA—TWELFTH FEDERAL RESERVE DISTRICT

(Dollar amounts in millions)

Selected Assets and Liabilities Large Commercial Banks	Amount Outstanding 5/21/86	Change from 5/14/86	Change from Dollar 5/22/85	Percent <sup>7</sup>
Loans, Leases and Investments <sup>1 2</sup>	202,276	190	10,197	5.3
Loans and Leases <sup>1 6</sup>	183,412	185	9,943	5.7
Commercial and Industrial	52,386	— 489	— 149	— 0.2
Real estate	66,968	244	3,881	6.1
Loans to Individuals	38,922	— 48	4,843	14.2
Leases	5,627	— 8	266	4.9
U.S. Treasury and Agency Securities <sup>2</sup>	11,028	12	— 564	— 4.8
Other Securities <sup>2</sup>	7,836	— 7	817	11.6
Total Deposits	200,491	— 1,318	7,644	3.9
Demand Deposits	48,297	— 1,646	4,464	10.1
Demand Deposits Adjusted <sup>3</sup>	33,792	— 650	— 6,269	— 15.6
Other Transaction Balances <sup>4</sup>	15,737	— 20	2,621	19.9
Total Non-Transaction Balances <sup>6</sup>	136,457	347	560	0.4
Money Market Deposit Accounts—Total	46,440	440	3,063	7.0
Time Deposits in Amounts of \$100,000 or more	36,234	— 135	— 2,162	— 5.6
Other Liabilities for Borrowed Money <sup>5</sup>	23,854	— 405	552	2.3
<b>Two Week Averages of Daily Figures</b>	Period ended 5/19/86	Period ended 5/5/86		
<b>Reserve Position, All Reporting Banks</b>				
Excess Reserves (+)/Deficiency (—)	28	— 15		
Borrowings	41	39		
Net free reserves (+)/Net borrowed(—)	— 13	— 55		

<sup>1</sup> Includes loss reserves, unearned income, excludes interbank loans

<sup>2</sup> Excludes trading account securities

<sup>3</sup> Excludes U.S. government and depository institution deposits and cash items

<sup>4</sup> ATS, NOW, Super NOW and savings accounts with telephone transfers

<sup>5</sup> Includes borrowing via FRB, TT&L notes, Fed Funds, RPs and other sources

<sup>6</sup> Includes items not shown separately

<sup>7</sup> Annualized percent change